Official Newsletter

SouthEastern Michigan

Computer Organization, Inc.

SEMCO

DATA BUS

Holiday Greetings
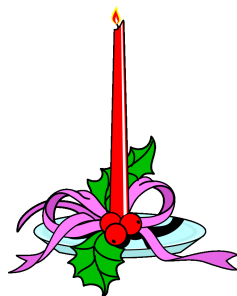
| Volume 26 | December 2001 | Number 12 |

IN THIS ISSUE

The SouthEastern Michigan Computer Organization, Inc. (SEMCO) is a non-profit, 501(c)(3), group dedicated to providing information, education and a forum to computer users (professional and amateur) and other interested individuals. Membership in SEMCO is open to all individuals 18 years or older. Persons under 18 years may become members through the sponsorship of a parent or guardian. Dues of $30/year include monthly DATA BUS, access to SEMCO's Message Service, and free personal ads.

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Your mailing label and membership cards list the month and year your membership expires. A DUES DUE message may appear on the newsletter back cover page two months before your subscription expires. Newsletters will not be sent after the month of expiration. Back issues may not be available. Renew your membership as early as possible to avoid missing any newsletters.

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NOTICE OF NOMINATIONS

Please take notice that under the Bylaws of the SouthEastern Michigan Computer Organization, Inc., nominations for officers will be taken at the December general meeting to be held Sunday December 9, 2001 at 1:30 P.M. with the election of officers to be held at the January general meeting. The following offices will be open for nominations:

1) President
2) Vice President
3) Secretary
4) Treasurer
5) Such Members at Large, up to a maximum of two (2) as shall be determined by the Board of Directors prior to the December general meeting.

SEMCO MEETINGS
Sunday,
DECEMBER 11, 2001

Board Meeting	**12:00pm**
General Meeting	**1:30pm**
SIG-IBM Meeting	**1:45pm**
SIG-MAC Meeting	**1:45pm**
Social Period	**3:15pm**
IBM Novice Group	**3:45pm**
SIG-IBM Intermediate	**3:45pm**

NOTICE OF ANNUAL MEETING AND ELECTION

The annual meeting of the members of the SouthEastern Michigan Computer Organization, Inc. will be held Sunday, January 13, 2002 at 1:30 P.M. in Room 172, of the Science and Engineering Building, Oakland University, Rochester Michigan. The election of officers and any Members at Large of the Board of Directors of the Corporation will take place at the annual meeting.

Gary DeNise
SEMCO President

On November 11th, I received an e-mail from Harold Balmer informing SEMCO that as of November 12th, he would be resigning from the SIG-MAC Chairmanship. This is due to health and medical problems. We have to appreciate this has to be his greatest concern at the present time. We hope that Harold receives the best of care and his recovery is speedy.

Harold's absence from the SIG-MAC Chairmanship will be felt by all. He deserves a very big **"THANKS"** for his time and leadership on behalf of the SEMCO membership.

We could definitely use a Volunteer from the membership to fill the SIG-MAC Chair.

Nominations for SEMCO officers will take place in December, so lets all give it some deep thought between now and then. To avoid USER GROUP BURNOUT we should step forward and lend a helping hand if possible. Give back what we receive from User Groups; the sharing of help, knowledge, wisdom and friendship. √

HOLIDAY SEASON GIVING

While you are thinking about your holiday season, end of year, giving, please consider a gift, cash or check, to SEMCO. Oakland University has notified us that they intend to charge us a fee for the use of the projectors in our meeting rooms and there is no money available in the budget to cover this. The Board is exploring the options available to us but whatever happens, it appears that we will incur significant additional expense. SEMCO has cut expenses everywhere it could without cutting services to the members and just managed to balance the budget. We must now increase revenue if we are to survive. Please give as much as you can. Any contributions will be used to further the purposes of SEMCO and to make it better.

The IRS has ruled that SEMCO qualifies as a non-profit charitable or educational organization under Section 501(c)(3) of the Internal Revenue Code so contributions by members and other persons will now be deductible for federal income tax purposes, by persons who itemize their deductions, to the same extent as donations to any other charitable organization. Dues paid for membership in SEMCO generally are not tax deductible as charitable contributions.
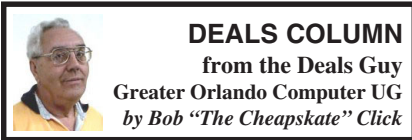
DEALS COLUMN
from the Deals Guy
Greater Orlando Computer UG
by Bob "The Cheapskate" Click

My Thoughts
Some asked if I would have anything to say about the Sept. 11 tragedy. Just about everything has already been said, but here are some disturbing observations.

At least three local people were arrested at various times and thrown in jail with intense questioning, then transported to Washington, DC for further questioning by the FBI. After three weeks of humiliating jail and questioning, all three were released because they had done nothing wrong. One was a doctor whose computers were also seized and his office shut down, putting his staff out of

work. The FBI's questions for these men were justifiable, but the answers were simple enough that I thought it could have been handled differently. All said they understood and were not resentful. What else can profiled people say?

A local storeowner with a thriving business was interviewed saying people won't buy from him any more. He may have to close. He's really an American citizen just trying to live the American dream.

Worse yet, on the news recently, a man was driving down the highway when all of a sudden a bullet shattered the rear window of his car, narrowly missing his small child strapped into the infant seat. His "look" apparently profiled him for somebody. He is also just an American citizen living and working in Orlando.

Nationally, since the tragedy, over 550 people have been arrested (or detained), hate mail has increased dramatically, even to profiled people actually born in USA. I read that at least 500 incidents have been reported against profiled people. Three were shot dead while others were stabbed, beaten and assaulted. Certain schools, mosques and businesses have been attacked, or received bomb threats.

I know some walk among us that hate Americans, but shouldn't we give a profiled person the benefit of the doubt first. Keep a sharp eye peeled for sure, but be careful how you judge people. Hate shouldn't corrupt "us" as it has our enemies. During World War II, my family was of German heritage, but fortunately, we were never threatened, and the neighbors all remained good friends.

In Keeping With The Rise In Patriotism

I included this item because it promotes buy-American. Their Web site is also pro-union, so if you dislike trade unions, please keep an open mind or skip it. In some states, the terms American- and Union- "made" are somewhat taken for granted. In other states, such as Florida, many flaunt that term. I, for one, am all for making "American" jobs, especially "union" jobs. To assist in finding American-made products, a new Web site is up and running. Check out <http://www.buyunionnow.com> for a guide on some products. Since it is new, there are only 500 items in 23 product categories. They can use help for finding more American-made products to feature. Some large products may be a problem with shipping directly to the consumer, but they are working on all that. I assume, at this point, that price is not the factor, just American-made, but I hope to see this Web site grow. Its getting harder and harder to buy "American" with so many companies deserting the USA looking for very cheap labor. *[Actually, the purpose of the site listed above is to promote U.S. labor unions and any "Buy American" or more correctly "Buy U.S." effect is secondary. They would not list U.S. made products that were made with non-union labor. Ed.]*

Icon See It Now

Aha-Soft's "**ArtIcons Pro 3.0**" is called "graphics editing" software. Here is their description: "Use this powerful utility to find and extract, edit, import and export icons and manage icon libraries. ArtIcons contains a variety of paint tools to let you create and edit icons with image formats in either standard or custom sizes, in color depths

up to 32-bit True Color. You can import icons from image, cursor and library files, and even from executables. ArtIcons allows you to arrange icons into libraries. It is the first such software to support Windows XP icon format." <http://www.aha-soft.com>.

PC User Group members can register ArtIcons Pro for $19.95 instead of $29.95 and save $10 ($14.95 extra for a CD). Here is a link to register: <http://www.regsoft.net/purchase.php3?productid=41421&pc=6U47X>. Password is "PCGROUP."

Ashampoo Isn't What You Think It Is

Actually, Ashampoo sells a variety of products listed here (nothing to do with your hair), but please visit <http://www.ashampoo.com/products> for all the info since this month's column is lengthy. Here's the lineup:

Ashampoo MP3 Studio Deluxe–$29.95
Ashampoo CD Recording Studio 2.0–19.95
Audio CD MP3 Studio 2000–$19.95
Ashampoo MP3 Check&Convert–$9.95
Ashampoo WinOptimizer 2000–$19.95
Ashampoo Powerup Deluxe 2000–$19.95
Ashampoo Uninstaller 2000–$19.95
Ashampoo Power Encrypt Deluxe–$19.95

A DealsGuy discount runs from now until December 31, 2001 and all user group members entering the voucher code "gcc156786" (typed in the "coupon" field) will receive 15% discount on all Ashampoo products in their new Element 5 shop! Go to <http://www.ashampoo.com/products> to buy Ashampoo products. Thanks to Bill Wilkinson of Keowee Computer Club for sending this one, originally an offer for their group.

Interested In New Web Development Software?

I asked about discount for my readers when this came in from Olson Software. Here's their description for **HyperText Studio**: "WYSIWYG Web site authoring tool. The WYSIWYG and HTML Code editors work together to ease page creation. Frame, ImageMap, and Cascading Style Sheet editors help you create attractive, functional sites. Site and link management tools let you manage projects of any size effectively. Integrated site management and editor features make creating your content as simple as drag and drop. Use Topic Styles for consistency. Tutorials help you learn quickly."

Prices are as follows:
Standard Edition (MSRP–$99)—Includes everything you need to create stunning Web sites.
Professional Edition (MSRP–$199)—In addition to Standard Edition functionality, build HTML Help, WinHelp, and printed documentation.
Enterprise Edition (MSRP–$499)—In addition to Professional Edition functionality, lets multiple users work together on a single Web site or Help file.

DealsGuy readers get 10% discount. There are three ways to order requiring this code: "hts:bc159."
1: Directly within the product. If you have downloaded the product, you can click the Purchase button on the startup dialog to be led through a wizard to securely purchase on-line. Enter the code in the "Comments and feedback" field.
2: Via their Web site, <http://www.olsonsoft.com/purchase.htm>. The code is added in the "Comments to Vendor" field.

3: Via fax/mail - make sure the code is added to the order form at <http://www.olsonsoft.com/orderform.htm>, and that it is faxed to 1-646-359-3962. If you have a problem, call them at 1-646-359-1408.

Links:

Web site URL: <http://www.olsonsoft.com>

E-mail: <support@olsonsoft.com>

Download: <http://www.olsonsoft.com/downloads/htsstd40.exe>.

Just In From APCUG, Act Fast!

RoadWired, a maker of computer cases and travel accessories for portable electronics, has become a sponsor for the APCUG fall Comdex event. An announcement was sent to all user groups, but I'm reminding my readers to check this deal. Visit <http://www.roadwired.com> for more information.

Some items on their Web site are already discounted 60%, but you get 20% discount on everything, including discounted items. Enter APCUG code number "1002128563" in the "coupons" box at checkout. This is only good on ONE order per member and this offer expires 11/31/01. By the time you read this, it will be too late for their other rewards.

Show Me The Way To Go Home

It's been a while since I've heard from Andy Sturdevant at DeLorme. I assume all users groups received this same announcement. I'll list the products below:

AO-6010-101–**DeLorme Topo USA 3.0** (CD-ROM version)—special price—$69.95

AO-6011-101–**DeLorme Topo USA 3.0** (DVD version)—special price—69.95

AO-6429-101–**Street Atlas USA Deluxe** (CD-ROM)—special price—$39.95

AO-5801-101–**Solus Pro 3.0** (CD-ROM) (mapping for the Palm) S&H is $5.00 and the priority code is "4041." If your group didn't get the order forms, your vendor coordinator should call Andy. Ordering may work on the Web site using the code. <http://www.delorme.com>.

Firewall Just For The Taking

I read a very good review for Tiny Personal Firewall in Virtual RAM, newsletter of the PC Rams Computer Club, and it looked pretty good according to their testing. They say it doesn't host any annoying ads. They used "Port Detective," which I'm not familiar with, to give it a good test and it passed with flying colors. The review author, Stephen Bigelow said this product has features he really likes. TPF is free for personal use and can be downloaded at <http://www.cnet.com>. Search for Tiny Personal Firewall.

FYI: I should soon have an announcement for the new USB 2.0 Pockey drives (20 gig shirt pocket size), which will be true plug-n-play. They also have a new cable, for those of us whose old Pockey drives would not work with a Toshiba or NEC laptop. The cable is available as a retrofit. <http://www.pockeydrives.com>

That's it for this month. Meet me here again next month if your editor permits. This column is written to make user group members aware of special offers I have found or arranged, and my comments should not be interpreted to encourage, or discourage, the purchase of products, no matter how enthused I might sound. Bob (The Cheapskate) Click <Bobclick@mindspring.com>. Visit my Web site at <http://www.dealsguy.com> for past columns. Also, I keep adding interesting articles (taken from user group newsletters) to my "Articles of Interest" page for viewing or downloading. √

A DSL Saga
by Judy Lococo
e-mail President@apcug.org

The saga begins in the year 2000, as I went in search of a broadband connection. There were three options available to me at that time, they came from a land far, far, away, and little was known about any of them. Baby Bell was the first contact, as they held all the existing telephone lines, and had to determine when my geographical area was available as DSL. Telocity (now DIRECTV DSL) was the second option, and they used the same telephone lines as Baby Bell. And then there was Insight Communications, which had all the television cable lines everywhere. How fortunate was I to have three available to me, when most had none!

After trying to understand numerous other terms that were alien to me, I discovered that I was blessed in that I was close enough to a CO (Central Office) with a DSLAM (Digital Subscriber Line Access Multiplexer) that my throughput would be blindingly fast. And, reasoning with myself that since Baby Bell owned the actual lines, if something happened to my service, they would be more eager to correct any problems, than if I was a Telocity customer, using the Baby Bell lines. So I asked Baby Bell to establish DSL service to me.

It was such a new technology at that time that there were many technical difficulties. For one, Baby Bell was so rabid about not allowing any of the home users actually using more than one computer in a home environment to access their DSL, that they mandated that I had to use an internal modem (more heat inside my computer). I couldn't share the DSL connection with my old computer that I had networked with a new one. They showed no remorse for the fact that their DSL storm troopers had buggered up my two-computer LAN to the point that I now had to disable the network card to the old machine before I could even access the DSL line. And I was even using a different protocol on my network since the DSL line already had a lock on TCP/IP and wouldn't allow the home network card to use that protocol. Needless to say, trying to print a document from the old machine to the printer attached to the new one, took some very fancy maneuvering. Of course, if I had elected to have the business DSL ($$) I could do all these marvelous things without any problem. For two computers, one of which started out life as a 486 machine, this did not compute.

The first problem I encountered was with the telephone line filters that are necessary if you wish to use the DSL service. Every extension in your house must have a filter on it, and unfortunately the one Baby Bell sent me for the wall phone in the kitchen was faulty. I asked for a replacement, but they couldn't replace just one, as nobody had ever done that before! So basically, I phoned and complained about their line filter for the wall phone every month for six months before they finally decided they would send me one that did work. However, what this meant was that my kitchen phone was worthless for six months.

I have always had a Hayes modem, not a Hayes-compatible modem, as I wanted top of the line error-correcting whenever I was using the phone lines. This Baby Bell internal modem was

nothing but problems from the third day it was installed, and my wait on the phone to tech support was most depressing. Sometimes the device worked, and sometimes it didn't, and when it didn't, I had to re-boot my machine and try it again. I must have had to reboot my machine hundreds of times during the course of the 14 months I had the Baby Bell DSL for their modem connection alone, and then you have to add to that the times the computer itself seized up when I did something blonde. I'm surprised my "control," "alt," and "delete" keys have not been worn down to a nub.

Baby Bell tech support was generally adequate, and they do have a really nice feature on their answering messages that give you an estimated wait time. But don't expect them to bypass any of their routines simply because you say you have already done them. They are going to assume that you are an imbecile, and work upwards from there. By the time the call finally reaches a point where they can converse in acronyms on equal footing with you, you've wasted at least a half-hour!

After fighting with the internal modem for over a year, I decided to complain even louder about their faulty equipment when I had to call in for some other problem. So the tech support people checked my line and found that my modem was an iffy component, and they would be sending me another. So I asked what it would take to get an external modem, as what they were sending me was basically not going to help my home network agonies. They asked a supervisor to bless it, and all agreed they could get me an external modem for half-price, since I had used their service for over a year and

the existing modem inside the machine was paid for. I said, "Great, let's do that!" The USB external modem arrived at one of my busier times, so it sat in the box for a couple of weeks before I even opened it. My telephone bill arrived in the meantime, so I checked it to see if the $37.50 half-price charge was on there. Imagine my surprise when I discovered they had charged me $18.50 for one of four installments, which basically said I was paying full price for it. Once again, Baby Bell was lying to its customers, and hiding it under an enigma of numbers.

I phoned Baby Bell and explained to all who would listen that I had been wronged. It fell on really deaf ears. Never mind that I have had outrageous monthly phone bills for thirty years, or that I have recently discovered that a directory service request for a new phone number listing is now one thin penny short of two dollars! So I told the woman on the phone that if I couldn't find any resolution to the fact that they had lied to me, then I didn't wish to deal with them any more except on a have-no-choice basis, as they are a monopoly where my local telephone service is concerned. They could take their DSL back to Never Never Land. She said there was nothing anyone could do, so I explained that I no longer wanted to use their DSL service. While I was on the phone talking to her, getting instructions on how to return this external modem, etc., they totally disconnected me from all Baby Bell DSL privileges. I did not even have time to pull e-mail off their server before I was denied access to it. I was not given time to notify people that Jlococo@bellsouth.net was no longer a viable e-mail address. Basically, I was electronically guillotined! "How rude!"

I was suddenly without fast access and back to 56K dial-up speeds. This is tantamount to being mega-rich one day and a pauper the next. If you hadn't seen the Promised Land, you wouldn't know any better. So I put a panic call in to DIRECTV DSL, and they very candidly told me that their modems were external, cost approximately $500, but were included in the monthly cost of their service. I did have to agree to a year's service with them, but they didn't care if I had two computers networked or not. I could only sit in front of one at a time, and the dogs have not learned how to surf yet. However, whenever I discontinued their service, I had to return the modem to them. The biggest problem was that it could take up to three weeks for them to get the modem to me. Withdrawal pains, definitely.

However, the modem arrived just over a week after my call to DIRECTV DSL, so I figured I had a day of installation ahead of me again. I had to remove the Baby Bell internal DSL modem card, so it wouldn't conflict with the external DIRECTV DSL modem or my home network. Besides, at this point, it was just taking up space inside my PC. And, uh, geez, it also gave me a chance to visit with the dust bunnies populating the inside of my machine. Then I had to uninstall the Baby Bell software—this was not something you should try alone at home! It required the resident Alpha Geek's expertise to figure this one out, as the uninstallation itself wanted to wipe out a few "unused" files such as regedit.exe (among others) because their removal software reported that "I wasn't using it any more and really didn't need it." I think that was the final straw when I saw that they wanted to inflict harm on my computer because I had chosen not to use their service.

Once all remnants of the Baby Bell fiasco were removed, total time to setup the new configuration was just over an hour. For the most part, the installation went smoothly with no major issues along the way. The new setup included attaching the DIRECTV DSL modem to my telephone line and installing their software. It also included rerouting some of the ethernet cabling in the office and installing and configuring a DSL router/firewall between the modem and my computers. I did have to tweak my software firewall settings to make it all work together. At this point, I called in "Alpha Geek" for assistance with the firewall configuration.

The DIRECTV DSL modem and the DSL router are now flashing lights back at me (comforting to an external modem user) and my home network is happy again. I can print from any machine on my home network when I wish, I can access the Net no matter which machine I am using, and I don't have to pray that I remembered to disable the network card before I powered down the last time. I don't have to threaten my friends with a visit from Luigi if they send me a huge picture attachment, and life is once again good!

For even more acronyms and information about DSL, check out <http://www.dslreports.com>.

There is no restriction against any nonprofit group using the article as long as it is kept in context, with proper credit given to the author. This article is brought to you by the Editorial Committee of the Association of Personal Computer User Groups (APCUG), an International organization to which this user group belongs. Please e-mail the author if you use this article. √

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Browser Fun and Games
TWEAK INTERNET EXPLORER FOR FUN AND PRODUCTIVITY

My wife says I get cranky easily. She says it's a gene, or maybe a strand of my DNA, but I'm definitely crabby, and it happens whenever the computer starts acting up.

See, the last time I re-installed Microsoft's Internet Explorer, my Standard Button Bar, Address Bar, and Links were in different spots. To make me feel even crabbier, when I upgraded to a new version of Microsoft's Media Player, the Radio Bar appeared in the same spot my Links Bar should have been.

Going Back
The first thing I had to do was get my Bars back in order. In IE, just right mouse click on any blank area on the upper portion of the toolbar and click the check mark for each item you want to see or hide.

Toolbar Customizing
The neat thing about IE's bars is you can drag them onto other toolbars—up, down, left, or right—move them to the very top menu bar, and easily resize them.

I have the Pull down menus at the very top with an add-on Browser Recorder to the right. Below that is IE's Button bar, one I customized to add buttons I use often and remove rarely touched buttons. (Do it by clicking a blank portion of the toolbar area and selecting Customize. Be *very* careful you don't inadvertently hit the poorly placed Reset button in the dialog box.)

Next down is the Link bar with buttons linked to the spots I go to daily, followed below by IE's standard Address bar and Google's add-on browser towards the right.

If you start fiddling and foul up the size or placement of the bars, try this: From IE's Tools menu, click Internet Options, choose Programs, and click the Reset Web Settings.

The Magic of the Links Bar
One incredibly powerful—and underutilized—feature in IE is the Links bar. Mine has a button for each of the three search engines I use regularly. Other single-use buttons include PC World, Yahoogroups, PIBMUG, eBay, TVGrid, and a Web-based e-mail program.

Three more buttons are multi-function. When I click on any of them, a list of other links drops down. I use one for sites I visit almost every day, another for weekly visited sites, and the third for pages I've visited that I might want to go to again.

Link Bar Fix-Me-Ups
Microsoft has official advice for adding items to your Links Bar. They say to drag the icon for the page from your Address bar to your Links bar or just drag a link from a Web page. That works fine for a new link. But when you're ready to modify a link, you're stuck with using a click on the right mouse. You can do it but there's a slicker way.

Open PowerDesk or Windows Explorer and go to your \Windows\Favorites directory (now called Folders). With PowerDesk, open another window pane (use Control-F3) or in Explorer, open another Explorer.

You're going to do a few things, and you needn't do it in this order.

• **Rename the filename**: Make it shorter but remember that each file should end in "URL.." Use F2 or the right mouse button. Doing this will give you room for more items on the Links bar. For instance, Google is just "gog," PIBMUG is "PIB," TVGRID is "TV." You get the idea.

• **Change the Icon:** Right mouse click on the file and select Properties. Click Change Icon and Browse. You'll see many files, and some will contain icons. You can go up one level to the \Windows folder for other icons. Just click on any file that has an icon (you'll see them) and click it. That icon then represents the URL.

• **Add or Remove:** You may have a URL you often use in your favorites. Treat it as you would any other file— drag and drop it onto the Links folder. Want a Folder on your Links Bar? Nothing to it: In Explorer, it's **File** * **New** * **Folder** and then just add items (filenames ending with URL) to the folder. In PowerDesk, just click F7.

By the way, the changes are dynamic—you can see them immediately in Internet Explorer.

Favorites? While We're Here...

You might as well examine all the other items in your Favorites folder. They're all part of Internet Explorer's Favorites—you know, the stuff you see when you click the Favorites button. Many of these are poorly named, outdated, or useless. And I'll bet the majority of them could be better organized. Instead of using IE's Organize Favorites, use the method above. It's faster and substantially easier.

Steve Bass is a Contributing Editor with PC World and runs the Pasadena IBM Users Group. Write to him at <steve_bass@pcworld.com>. Check PCW's current edition at <www.pcworld.com/resource/toc/index.asp> and sign up for the Steve Bass online newsletter at <www.pcworld.com/bass_letter>. √

The Hard Facts… of Hard Drives
by Bruce Pechman
bigbruce11@hotmail.com

It's really not that hard. If you have been following my articles lately, you know that every couple of months I like to center on a particular PC component and explain it in simple English.

There are two components inside your PC I consider most vulnerable to failure from a mechanical origin. Those two components are your hard drive (HD) and your power supply. Translation: Your computer will probably die as a result of a hard drive malfunction, or a nondescript power supply breakdown. I liken this to the human brain and heart. You can absorb other minor injuries, but any concerning these two and both you and your computer will result in a blackout.

Before I explain the fundamentals of HDs, you should be aware that most computer manufacturers use inexpensive models of both these critical parts. When it comes time to upgrade your HD or select your new computer, make sure you consider these facts. In this article I will explain how to interpret the most common HD specifications.

Just the facts, please. Because this article is intended for home consumers, I will forgo any dialogue relating to SCSI and RAID technologies, and focus on the ubiquitous internal

3.5-inch ATA EIDE hard drives (a hard drive is also known as a hard disk).

The two acronyms you will hear most are ATA (Advanced Technology Attachment) and EIDE (Enhanced Integrated Drive Electronics). Don't be confused if you also see Ultra ATA or Ultra DMA (Direct Memory Access) because they all essentially refer to the same thing: ATA EIDE interface. And guess what? All that mumbo jumbo refers to is the rate of the hard drive interface and connection speed. Today, the most prevalent EIDE drives are the ATA/66 and ATA/100. The numbers mean that an ATA/66 drive's maximum rated speed is 66MBps. Don't get hung up on these numbers considering the real world performance difference between ATA/66 and ATA/100 is very negligible.

By the way, the next generation in the ATA interface (we may see this by next year) is what's called Serial ATA. Serial ATA uses only two wires, to and from the hard drive at 1.5 Gbps. This will be a vast step forward, as 1.5 Gbps is significantly faster than ATA/100!

One last thing to note about ATA EIDE hard drives is that if your Mother Board/Controller is not rated at the same speed as the hard drive (ATA/100 for example), it will not take of advantage of the hard drive's peak rate anyway.

Performance does matter when it comes to the platter. The platter is a rigid disk inside the hard drive that is covered with magnetic material that stores your data. Depending on the capacity, there may be several platters in your HD. A key specification that tells you about the drive's performance quality is what's known as "rotational speed". Rotational speed (also called spindle speed) is measured in rpm's (revolutions per minute), thus the 5,400 or 7,200rpm specification you read about. Normally, the higher the rpm's the better the performance. It's generally accepted that a 7,200rpm drive outperforms a 5,400rpm drive by 33% because of its ability to read and transfer data more quickly.

The next specification to determine a drive's performance is the "Cache Buffer." Cache Buffer, more commonly just called cache, can be thought of as the HD's temporary RAM storage. The cache of a HD plays a very important role; hence the larger the cache buffer the better. A 2MB cache buffer would be considered very adequate for a home PC.

The final indicator of a HD's performance is called "Seek Time." In short, the seek time is how long it takes the hard drive to find a particular track on the disk. Seek time is measured in ms (milliseconds) and on average is 7 to 13ms with the lower numbers being preferred.

One last tidbit—if you read anything about a drive's "shock tolerance" it will be measured in G's. This may sound crude, but this measurement relates to how hard a wallop it will take before the drive suffers damage. The average is about 200 to 300G's. Installing a replacement Seagate drive about a year ago, my German Shepherd couldn't resist the anti-static bag the drive was in, proudly running around while chomping down on the drive. After installing the drive and re-booting, nothing happened, but I digress.

The last two points to consider are related to the HD's reliability—the manufacturer's warranty and MTBF (Mean Time Between Failure). The MTBF is usually listed in hours and

indicates the manufacturer's expected life span of the HD. A nicely performing HD by today's standards would be an ATA/100, 7200rpm, 2MB cache, 40Gig, 8.5ms seek time, and offer a 3-year warranty. I personally prefer the IBM Deskstar GXP and Seagate Barracuda models. Happy Driving…um, make that Hard Driving! √

You Need A New Video Card
by Bruce Pechman

As most of you are well aware, two years of technology can practically leapfrog any hardware or software you may own. This holds especially true for the thousands of developers and publishers in the PC entertainment industry vying for your greenbacks.

In this column, I will attempt to convince you why your video card is a major player in getting the most performance from your PC. I guarantee you will learn something you didn't know, so let's get started!

Telling It Like It Is

Unless you are a true enthusiast like myself (and would probably rather spend your dough on weekend getaways than buying a new video card every 6 months) you may not be aware of why the video card is so critical in getting the most enjoyment from your computer.

The fact is you definitely do need a new video card every 6 months. Your computer is more than up to the task, providing it is a Pentium class running at least 266 MHz. However, if you bought a typical new computer in the last 3 years and it came bundled with a video card, I am sorry to say it is woefully inadequate for the task of running newer entertainment titles.

Why? Well I thought you'd never ask! I promise not to get too technical, but I think you will all relate to my analogy. When you go to buy a new stereo, you pick this great receiver rated at 150 Watts per channel with Dolby Pro Logic, DSP, etc. But when it all comes down to it, if your speakers are sub-quality cheapies, your stereo will sound pretty bad even with that fancy 150-Watt receiver.

This is exactly the same with a computer system (even today the Gateways & Dells are just getting this message and are finally bundling premium video cards with their systems). See, computers are all about visual information displayed on your monitor. This is how your computer communicates with you.

Ask What Your New Video Card Can Do For You

Things have changed big time. More folks are purchasing digital cameras, the Internet allows us to either download or view streaming multimedia content, and software entertainment developers want you to see their games or stories exactly the way they were designed utilizing the latest technology at the project's inception.

Let's put a few things into context here. With digital cameras or viewing Web sites the standard can easily be 24 to 32-bit color and resolutions up to 1024x768. Your current video card may not handle that and so the colors will be off or dulled. But this is just the tip of the proverbial iceberg. Let's talk about video, gaming, or any form of digital video.

Two words come to mind…Frame Rate. If you have a typical video card it may have 4MB (poor) or 8MB (still

poor) of video RAM (VRAM). Guess what—you can hardly buy a new video card today with less than 32MB and more than half have 64MB of VRAM! Next month, a video card will debut with 128MB of VRAM. That's right—probably more than your computers entire system RAM. But don't despair; you definitely will not need that card anytime soon. The point is the primary function of the video card is to offload the laborious chore of graphics rendering from the CPU. That, my friends, is the crux of the matter. This will free your CPU to take care of business without the heavy load of the software rendering process.

Remember the Frame Rate thing I spoke of? Frame Rates are measured in frames per second, and today's minimum standard for games or digital movies is 30fps (frames per second). A new video card with 32MB of VRAM will allow for silky smooth frame rates passing 60fps, and, depending on what the screen resolution is, possibly over 80fps.

In addition, your computer will be running happy as "a pup with a plate of vanilla ice-cream on a hot summer day" as the CPU is not overburdened when running these graphic intensive entertainment nuggets.

What's All This Talk About PCI, AGP, and 2D and 3D?

Read on so I can clear this up. All video cards today offer outstanding 2D and 3D integrated support. 2D is basically what you normally see such as you desktop, applications and data files. 3D kicks in when a game, multimedia or 3D modeling app requires it. So, a good quality video card will provide you with enormous benefits whether you're working in Office, cruising the Web, game playing, or viewing rich multimedia content.

Keep in mind that most video cards sold today are AGP (Accelerated Graphics Port). In addition, most new motherboards over the last 3 years include an AGP slot. AGP commonly comes in two speeds; 2x and on newer motherboards 4x. Even if you decide on a 4x AGP video card, but your motherboard is only 2x there is no problem as the cards are designed to work flawlessly under 2x AGP conditions.

I promised not to get too technical, but it is important to know why AGP is a superior technology to the alternative, PCI (Peripheral Component Interconnect). 2x AGP can transfer data to the video card at a maximum rate of 533 MBps (Megabytes per second). 4x AGP can transfer data to the video card at a maximum rate of 1,067 MBps.

However, the slower standard PCI slot can transfer only a modest 133 MBps. In a nutshell, the 2x or 4x AGP video cards are the way to go if your motherboard supports them because they can deliver data to video card at extremely fast rates.

I'm Sold…But What Video Card Do I Buy?

There are basically two camps battling for video chipset supremacy today. The two contenders are **3DFX Interactive's VooDoo 5 chipset** (as in the currently shipping VooDoo5 5500 series) and **Nvidia's GeForce2** (as in the currently shipping GeForce2 GTS series). *[The GeForce3 chipset is now out. Another high performance video chipset and card manufacturer is ATI. Ed.]*

Now the tricky part about vendor selection. For the Nvidia chipset, there are about 6 mainstream video card

manufacturers with your choice or either 32 or 64MB of VRAM on board, but they will all use a GeForce chipset.

For the 3DFX chipset, you have no choice of manufacturers as 3DFX makes both the chipset and the board as a sole source. The 3DFX 5500 series comes only in a 64MB configuration. But, 3DFX just released a PCI version of the 5500 series, which may be your only option if you do not have an AGP port and want the newest card.

Enough, Give Me The Bottom Line

OK, I will tell you the best deal vs. performance out there in my opinion. Keep in mind all the new boards I mentioned from both Nvidia and 3DFX are about $299 (expect to shell out another $100 if you want the 64MB version of the Nvidia board). By the way, you really don't want to invest in the 64MB version from Nvidia as it only offers marginally better performance than its 32MB sibling. For details about the 32MB vs. 64MB argument go here: <http://www.tech-review.com/review.pl?id=160>.

My choice would be…the fact is both cards are very close in performance. When all the reviews are said and done, it's summarized like this: Nvidia has a slight edge in faster fps, but the 3DFX chipset makes graphics look a little better on screen as their Full-Screen Anti-Aliasing (FSAA) technology is better than Nvidia's.

Additionally, be aware that the price of video cards may differ because of what is called "Gaming Bundles" or "TV Out" features. This means that some manufacturers will bundle the full version of currently shipping games with the video card. TV Out means you can hook up your TV as your monitor (not something I want to do anytime soon).

Choices, Choices

So what I am telling you is that you can't go wrong with either the 3DFX VooDoo5 5500 AGP ($299) or the Nvidia GeForce2 GTS ($299—I did find this for $239 on the Web—(800) 585-4080 part # S1100073). If this is too steep for your allowance money, you can also investigate the lower end models of both companies' products.

For 3DFX, you can look into the soon- to-be-released VooDoo4, or the VooDoo3 series at around hundred bucks. From Nvidia, you can research the original GeForce 256 chipset released last October, or even the newer low cost alternative, Nvidia GeForce2 MX (which should be available by the time you read this) for around $150 as well. Keep in mind the newer cards support 32-bit color as well as the latest technologies, and are priced very attractively for the enjoyment they will bring to your life and PC.

Final Thoughts

Believe it or not I tried to make this article readable while foregoing the technical jargon. The fact is, video cards in-and-of themselves are extremely complex animals. A few years back, there was a major clash over what API would be supported on the cards: Glide, Open GL, D3D, RAVE, or Direct X. Thank goodness this has all been sorted out and most cards today will be able to support most anything you throw at them.

Keep in mind to always keep your video card drivers current even if you don't buy a new card. When I get a new card, I just assume the drivers on the CD are old and that a newer set of drivers are just a click away at the manufacturer's Web site.

A few words about installing your new video card; ah forget it – why reinvent the wheel when you can just go here: <http://www.gamecenter.com/Hardware/Doit/Upgradevid/>.

By the way—there is a reason I wrote that line about the pup and the ice cream. Bruce is in the doghouse right now as his wife stews over his choice in getting the newest video card, and she no longer gets the promised weekend getaway to Hilton Head. √

Harold Balmer
The Need for Speed
Continues—DSL

CORRECTION

In my article "The Need for Speed Continues—DSL ," I missed the fact that if you are thinking of DSL, Cable or Satellite service, you will need an Ethernet port on your computer. I also got an e-mail from Earthlink warning you that, **IF** you change local dial tone phone service providers, your new provider may not have a contract with Earthlink, so Earthlink will not be able to reconnect to your phone line, and you will lose your DSL service. √

BOARD MEETING
11/11/2001
Carol Sanzi

BOARD MEMBERS PRESENT: President Gary DeNise, Treasurer Roger Gay, Secretary Carol Sanzi, SIG-Advanced Chairman Franz Breidenich, SIG-IBM Co-Chairman Tom Callow, and SIG-MAC Chairman Harold Balmer. Also attending was SIG-IBM Co-Chairman Warner Mach. Arriving late was Vice President Vic Charns. The meeting was called to order at 12:04 pm. **OLD BUSINESS:** Treasurer Roger Gay reported that the balance on hand is $2786.09. The membership is now 106 with several renewals not recorded.

The nine volunteers who worked the Microsoft eXtreme Event on October 20, 2001 will receive a copy of Microsoft Windows XP during the general meeting today.

NEW BUSINESS: Harold Balmer submitted a letter of resignation as of Nov. 11, 2001. He will ask the 3 or 4 members of the SIG-MAC if one would be willing to step forward and run next month's meeting.

Cheryl Fil has volunteered to accept the position as editor of the DATA BUS as of January 1, 2002, with the help and guidance of Bob Clyne.

Oakland University has notified SEMCO that as of the first of the year there will be a rental fee charged for the equipment we use each month. Bob Clyne and Gary DeNise will meet with Oakland University's Instructional Technology representative, George Preisinger. They will discuss fees and the feasibility of SEMCO remaining at Oakland University.

Gary DeNise suggested that since SEMCO is a charitable organization, financial contributions will be accepted. These monies could help pay for the room rentals.

Roger Gay will have tax receipts ready next month for those willing to make a donation.

Franz Breidenich moved to reimburse Carol Sanzi $50.50 for the Cookie Bouquet sent to Harold Balmer. Tom Callow seconded the motion and it was carried.

The meeting adjourned at 1:00 pm.

SPECIAL INTEREST GROUPS (SIGs)

SIG-MAC
Harold Balmer

Toast 4.1

If you missed the last meeting, you missed the last meeting. Due to ongoing medical problems, I have resigned as the Chairman of SIG-MAC. I am not sure what the future of the SIG is.

At the meeting we looked at the Iomega CD-RW 4x4x6 (write, re-write, read) external drive. This is an external CD that hooks to the computer through the USB bus and has its own power supply. That means that you can use this drive with your Mac and/or your PC, as long as you have USB. On my Apple Powerbook, I don't have a USB port, but I do have a PCMCIA port, into which I have installed a PCMCIA to USB card. The cost of the machine is $179 less a $30 mail in rebate for an end cost of $149.00 (OfficeMAX).

One of the warnings that they give is that **IF** you have problems trying to write a disk, you may need to turn off most of your extensions, as they might interfere. They also recommend (and I agree) that you need to increase the RAM buffer to as large as you can (64 is Max) without increasing the amount of memory the program runs in.

You can do files/folders (data), Music, or Disk duplicate. I showed how to drag and drop files and folders into the program, how it then told me how much I was trying to put on the CD disk. I showed the simulate mode, the speed test and finally writing the disk or just a "write session." If you do a "write session," if there is still room on the disk, you can add material to the disk. If you "write disk," that is it, nothing can be added later.

Write speed is critical. If you don't have a steady data feed, the write session will fault out and you will ruin your new CD-R disk. I found that slower was better, even when doing a disk copy. Read the original disk through the normal CD and write to the CD-RW drive. It takes about 30 minutes to write a complete disk (700 MB) at 2X.

I showed how to look at a disk and determine how full the disk is and what kind of disk you are looking at. If the erase button is grayed out, then it is a CD-R disk. But if the erase button is dark, then you are looking at a CD-RW disk. After we were done, I passed out a sheet about Toast 5, done by Terry White of MacGroup Detroit. My reason for showing Toast 4.1 was to prove that the Iomega CD-RW package, as sold, will work great.

As for next month—check the SEMCO Web site.

DECEMBER 9: To be announced. √

SIG-ADVANCED
Franz Breidenich

DECEMBER 3 (Next: JANUARY 7), Monday: Meetings held first Monday 6:45pm at Troy Public Library. TOPIC: Wide ranging discussion of computers and computing. √

DECEMBER 9: Windows CE and the Pocket PC: SIG-IBM Co-Chairman Tom Callow will discuss and demonstrate the Pocket PC and describe the improvements in the latest version, Windows CE 2002. √

DECEMBER 9: Winamp and Visualizations: Jack Vander Schrier will demonstrate and discuss Winamp and visualizations. Winamp is a fast, flexible, high fidelity music player for your computer. √

DECEMBER 9: Q&A: Member- directed discussion. √

Arthur was delighted with the new bot program
he had downloaded from the Internet

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JANUARY 2002 DATA BUS DEADLINE (10th day after meeting)
SEMCO & SIG DATA, & MEMBERS' ADS - Deadline: Wed, Dec. 19, 11:59pm
Members' personal ads free. To mail, use Editor address on Page 2; e-mail address: clyne@mich.com PLEASE send to arrive sooner than deadline if possible.
BUSINESS ADS - Deadline: Second Friday monthly. Mail **unfolded** camera-ready copy; payment in full made out to SEMCO, to the Editor (address Pg 2).

Bob Clyne
clyne@mich.com
(to post monthly computer group info)

**CALENDAR-OF-EVENTS
OTHER GROUPS**

AAIICI (American Association of Individual Investors, Computerized Investors),
  January 26- Saturday, 10am-Noon (Meet 4th Saturday) (not December); W. Bloomfield Huntington Bank, Orchard Lk Rd., S.of Maple Rd. Info: Jack Lockman at 313-341-8855 or <thunder@tir.com>

COMP (Computer Operators of Marysville/Port Huron)
  December 5 - Wednesday, 7pm (Meet 1st Wednesday): Rm 201, Clara E. Mackenzie Library-Science bldg, 323 Erie St., Port Huron. Ron Walters, 810-679-4144. Web: <http://www.bwcomp.org>**. TOPIC: Christmas Party.**

DCOM Computer Club
  December 14 - Friday 6:30 - 8:30 pm (Meet 2nd Friday); Henry Ford C.C., Patterson Tech Bldg, Ford Rd/Evergreen, Rm T143, Parking Lot C. Info: Doug Piazza 313-582-2602

Delta Computer Club
  January 31 - Thursday, 7pm (Meet last Thursday) (not Nov/Dec); Bay de Noc C. C., Escanaba. Info: Gordon Nelson, Pres. & Editor at <gnelson@bresnanlink.net> or 906-428-1014.

GDOUG (Greater Detroit OS/2 Users Group)
  December 13 - Thursday, 6:30pm (Meet 2nd Thursday); Stardock Systems, Farmington Rd, N. of Six Mile, Livonia; Info: Carolyn Kolaz, Pres. at <76460.3040@compuserve.com>. Map on Web: <http://www.lookinc.com/gdoug>.

MacGroup Detroit
  December 16 - Sunday, 3pm-5pm (Meet 3rd Sun.); Southfield Civic Center, 26000 Evergreen Rd., Room 221. Info: Terry White, <terry@macgroup.org> or 313-571-9817. Web: <http://www.macgroup.org> **TOPIC: Michael "Firewire Gooooooood" Balas of Apple Computer Inc.**

MacTechnics, **(MAC User Group)**, Coffee 9:00am, SIGs 9:30am, Main meeting 11:00am.
  December 15 – Saturday, 9am–1pm (Meet 3rd Saturday); U of M, Central & Medical Campus, Medical Science II building. (See map on Web: <http://www.mactechnics.org>). Info: Cassie at <cassiemac@yahoo.com> or 313-971-8743.

MCUG (Michigan Computer Users Group)
  December 20 - Thursday, 7pm (Meet 3rd Thursday); 35271 Rockingham Dr, Sterling Hts., MI 48310-4917; Info: Jerry Zinger, Pres., <kahunazing@netscape.net> 810-792-3394.

Michigan Apple Computer User Group
  Dec. 13 - Thu 7pm (Meet 2nd Thu) MAC: Troy Library, I-75 at Big Beaver; **Dec. 19 - Wed 7pm** (Meet 3rd Wed) IIGS, Apple II/Apple-Works, Parent/Teachers Ed, PC, Internet: St Bede School, 12 & Southfield; **Dec. 20 Thu 7:30pm** (Meet 3rd Thu) MAC Media Arts, Programmers: St. Bede. Info: Carl Pendracki 248-647-8871 or <carlpen@aol.com>. Web: <http://www.michiganapple.com>.

Oak Park Computer Club
  Meets every Friday, 10:15am (except holidays) at Oak Park Library, Oak Park Blvd. at Coolidge Hwy.

SHCC (Sterling Heights Computer Club)
  December 4 - Tuesday, 7:30pm (Meet 1st Tuesday: not July/Aug); Carpathia Club, 38000 Utica Rd, Sterling Hts, Pres. Don VanSyckel at <Don@VanSyckel.net>, 810-731-9232 ; Web: <http://member.apcug.org/shcc>.

SVCA (Saginaw Valley Computer Assoc.)
  December 13 - Thursday, 6:30-9:00pm (Meet 2nd Thursday); Saginaw. Info: Kay Engelhart, program chairperson at <kengelhart@hotmail.com>.

Wayne State U. Mac User Group
  December 8 - Saturday 10:00am-Noon (Meet 2nd Saturday); at Mich.com, 21042 Laurelwood, Farmington. Info: Lorn/JoAnn Olsen 248/478-4300 or Denny MeLampy 248-477-0190, <denny@mich.com> **TOPIC: Questions, Shortcuts, Tips and The Internet.**

TAX DEDUCTIBLE DONATIONS
SEMCO Members Helping the Community

Beth Fordyce is accepting Macintosh computers, components, peripherals, manuals and software (working or broken) for Immaculate Heart of Mary School PreK–8th grade, 175-200 students for computer science classes. Contact Beth 734/453-0349 7pm–10pm or bfordyce@mediaone.net You may also contact the school directly: Sister Mary Stephanie Holub 19940 Mansfield (Greenfield/8-Mile area, Detroit) 313/272-0990

If you want to use your donation as a tax deduction, make an itemized list (with one copy for yourself) of items you donate, and attach it to your donation. Include on the list the full name or description of each item, and its fair market value. Also make sure your full name, address and phone number are on it. The donatee will see that you receive a receipt. (Be advised that no one will make these lists for you.)

NOVEMBER REFRESHMENT DONORS

Warner Mach, Coordinator
Al Bochenek
Roland Maki
Carol Sanzi
Dawn Sanzi

COMPUTER RESOURCE PEOPLE

This is a list of members willing to be resources for other members to call when they have hardware or software questions. Are you willing to help members learn? Which software programs are you familiar enough with?

It is not necessary to be an expert, but just have some familiarity with the program and be willing to help someone starting to learn it. Please give this some thought and volunteer at the next group meeting.

AutoCAD: Comptois, Gay
Genealogy: Cook
IBM PC Hardware Issues: Clyne, Gay, Yuhasz
IBM Windows Operating Systems: Clyne, Yuhasz
Lotus 98: Diller
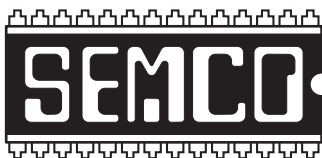**MAC Hardware and OS Issues:** Yuhasz
MS PowerPoint: Diller
MS Word: Clyne, Diller
Novell Netware: Yuhasz
Quicken: Clyne, Gay

Clyne, Bob—810/387-3101, 9am-10pm
Comptois, Jerry—248/651-2504, anytime
Cook, Stephen—313/272-7594, eves
Diller, John—248/540-4382, eves
Gay, Roger—248/641-7799, 9am-10pm
Yuhasz, Steve—734/953-3794, eves

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**SOUTHEASTERN MICHIGAN
COMPUTER ORGANIZATION, INC.**

SEMCO CALENDAR—December 2001

SCIENCE & ENGINEERING BUILDING, OAKLAND UNIVERSITY, ROCHESTER, MICHIGAN

<u>December 9 – SUNDAY (Meet 2nd Sunday)</u>

SEMCO <u>Board</u> Meeting at 12:00 pm, **Room 172.** For Officers and SIG Chairpersons. Other members are invited to attend.
SEMCO <u>General</u> Meeting at 1:30 pm, **Room 172. Nominations.**

Special Interest Groups (SIGs)

<u>SIG-IBM</u> 1:45 pm, **Room 172. Pgm: Windows CE and the Pocket PC:** SIG-IBM Co-Chairman Tom Callow will discuss and demonstrate the Pocket PC and describe the improvements in the latest version, Windows CE 2002.

<u>SOCIAL PERIOD</u> 3:15 pm, **Room 164.** Refreshments! (Reminder: We must maintain a neat environment.)

<u>NOVICE-IBM GROUP</u> 3:45 pm, **Room 164. Pgm: Q&A, member-directed discussion.**

<u>SIG-IBM Intermediate</u> 3:45 pm, **Room 172. Pgm: Winamp and Visualizations:** Jack Vander Schrier will demonstrate and discuss Winamp and visualizations. Winamp is a fast, flexible, high fidelity music player for your computer.

<u>SIG-MAC</u> (All Apple Macintosh products) 1:45 pm, **Room 168. Pgm: To be announced.**

<u>December 3 – M0NDAY (Next: January 7), 6:45 pm</u> (Meet 1st Monday),
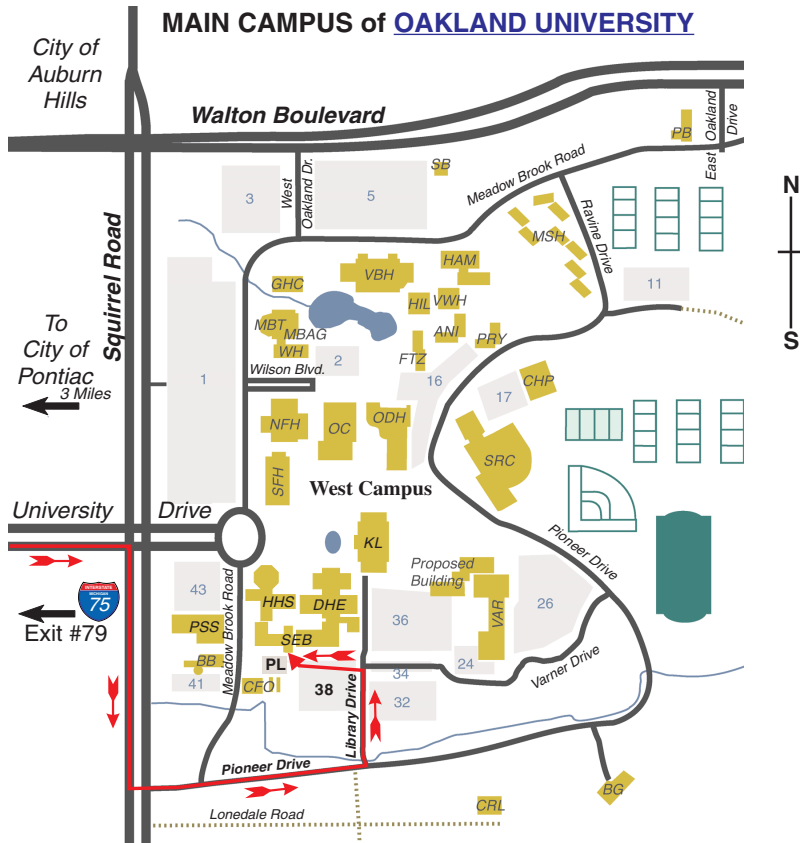**<u>SIG-ADVANCED</u>** Troy Public Library, 510 W. Big Beaver Rd in Troy, at I-75 exit. See the sign in the lobby for room assignment. Info: Franz Breidenich 248/398-3359. **TOPIC: Wide-ranging discussion of computers & computing.**

<u>January 13 – SUNDAY</u> (Meet 2nd Sunday).
<u>SEMCO</u>, 1:30 pm. **Election.**

PUBLIC INVITED

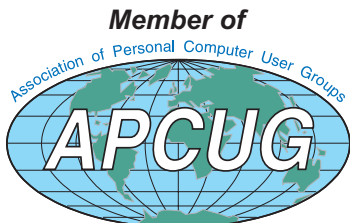**(Please copy this and the next page to post on your bulletin board)**

MAIN CAMPUS of OAKLAND UNIVERSITY

City of Auburn Hills

Walton Boulevard

Squirrel Road

To City of Pontiac
3 Miles

University Drive

I-75
Exit #79

West Oakland Dr.

Meadow Brook Road

Ravine Drive

East Oakland Drive

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West Campus
KL
Proposed Building
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VAR
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CFO
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34
24
41
32
Meadow Brook Road
Library Drive
Pioneer Drive
Varner Drive
Pioneer Drive
Lonedale Road
CRL
BG

MAP LEGEND

SEB	**Science and Engineering Building**
DHE	**Dodge Hall of Engineering**
KL	**Kresge Library**

Note: SEMCO meetings are in the **Science** (west) wing of the **Science and Engineering Building**.

DIRECTIONS

Driving north on I-75 (from Detroit and suburbs), take Exit 79 (University Drive), stay to the right on University Drive to campus entrance. Turn right (south) on Squirrel Road (at traffic light which is just outside campus), turn left on Pioneer Drive (next street to left). Turn left off Pioneer Drive onto Library Drive (second left) toward Kresge Library. Turn left before you get to the buildings, into parking lot 38 on the left. Proceed to the far end of the parking lot and up to the next lot. After parking, enter the first set of glass doors (at the SE corner of the building).

Member of

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APCUG